CHAPTER B10

LEAD CONTROL

B1001. DISCUSSION

a. The purpose of this chapter is to prevent lead intoxication and related injuries during the use, handling, removal and melting of materials containing lead.

b. In this chapter, “lead” means metallic lead, all inorganic lead compounds, and organic lead soaps. Lead's low melting point, high molecular weight, high density and malleability make it useful structural material. When added to resins, grease, or rubber, lead compounds act as antioxidants. Common uses for lead and lead compounds include ballast, radiation shielding, paint filler and hardener, rubber and pipe joints, high voltage cable shielding, small arms ammunition, batteries and weights. While not an absolute indicator, red, forest green, chrome yellow and "school bus" yellow color paints typically contain lead compounds. Lead may also be found in polyurethane and water based paints.

c. Significant lead exposures can occur during: lead and babbitt melting and casting; ballast handling; spraying, sanding, grinding, burning, and abrasive blasting of lead-containing materials and lead-containing paint; brazing with torches; high voltage cable repair; abrasive blasting with smelting slag; lead-acid battery reclaiming; machining lead; disassembly of gasoline engine components (which have used leaded gasoline); and handling of contaminated personal clothing.

d. Lead is a recognized health hazard. Lead may adversely affect the peripheral and central nervous systems, as well as the red blood cells, kidneys, reproductive and endocrine systems.

e. In recognition of the serious health hazards associated with lead and the numerous sources of potential lead exposure, the Navy has established strict controls to limit both occupational and environmental exposures. Standards and controls discussed in this chapter shall be applicable to all Navy personnel.

B1002. PERMISSIBLE EXPOSURE LIMIT AND ACTION LEVEL TRIGGERING REQUIREMENTS

a. **Permissible Exposure Limit (PEL)**. The PEL for an 8-hour time-weighted average (TWA) exposure to airborne lead is 50 micrograms per cubic meter (ug/m^3) of air.

b. **Action Level (AL).** The AL for an 8-hour TWA exposure to airborne lead is 30 ug/m^3 (without regard to respirator use).

c. **Biological monitoring and medical surveillance** shall be initiated when an employee’s exposure exceeds the AL for more than 30 days per year.

d. **Engineering and administrative controls** shall be initiated when an individual's exposure exceeds the PEL for more than 30 days per year. When a person's exposure is greater than the AL, but less than the PEL, engineering controls shall be initiated to reduce the workplace environmental level to a maximum of 200 ug/m^3. Thereafter, any combination of engineering and administrative controls may be used to maintain exposure at or below the PEL.

B1003. LEAD CONTROL RESPONSIBILITIES

a. **The commanding officer shall** not authorize paint removal for cosmetic reasons or due to excessive paint thickness. They may only authorize paint removal to protect the ship from corrosion, when incidental to hot work, and when bare metal is required for an inspection.

b. **The safety officer shall**:

(1) When applicable, as determined by the baseline industrial hygiene survey, establish effective shipboard lead control practices that include as a minimum those elements in paragraph B1004.

(2) Verify that the ship has the proper clothing and equipment aboard to protect personnel during shipboard lead work.

(3) Notify the commanding officer when sufficient funds are unavailable to obtain mandatory protective clothing and equipment to protect ship's force personnel during shipboard lead work.

(4) If specified in the baseline industrial hygiene survey, ensure a written compliance plan to comply with lead control requirements is available. The supporting industrial hygiene officer/industrial hygienist should prepare this plan.

(5) Implement lead hazard training for all personnel identified in the baseline industrial hygiene survey as potentially exposed to lead at or above the AL.

(6) Request industrial hygiene assistance for the evaluation of new potential lead hazards.

c. **Division officers shall**:

(1) Ensure that personnel required to perform work involving lead exposure are provided with proper clothing and equipment and trained in its use.

(2) Ensure that personnel who work with lead or who work in areas where the potential exists for lead exposure at or above the AL are properly trained.

(3) Identify to the medical department representative (MDR), personnel who work with lead or who work in areas where the potential exists for lead exposure at or above the AL.

d. **The MDR shall**:

(1) Assist the safety officer with conducting lead hazard training upon request.

(2) Schedule personnel for blood lead analysis and physical examinations at shore medical activities as required for medical surveillance.

e. **All hands shall**:

(1) Obtain and properly use protective equipment and use safe work practices as trained when working with lead.

(2) Report for medical surveillance tests and examinations, when scheduled.

B1004. LEAD CONTROL ELEMENTS

The following elements, as a minimum, are necessary to carry out effective lead control:

a. Industrial hygiene survey (paragraph B1005)

b. Control of lead in the workplace environment (paragraph B1006)

c. Waste disposal procedures (paragraph B1007)

d. Medical surveillance (paragraph B1008)

e. Written compliance plan (paragraph B1009)

f. Worker and supervisor training (paragraph B1010)

B1005. INDUSTRIAL HYGIENE SURVEY

a. An industrial hygienist shall evaluate all workplaces in which lead is used. This evaluation shall be accomplished during the baseline industrial hygiene survey specified per Chapter A3. Where a potential for exposure from inhalation of airborne lead particulate or personnel contamination is found, the industrial hygienist shall establish an exposure monitoring plan to characterize personnel exposures. When personnel lead exposures warrant, the industrial hygiene survey shall identify the need for the command to have a written lead hazard compliance plan and provide the specific content for the plan.

b. Within 5 working days after the receipt of exposure monitoring results, the command shall notify affected personnel in writing of results that represent their exposure. Whenever the results indicate that the individual was exposed above the PEL, without regard to respirator use, the written statement shall include that fact and a description of the corrective action(s) taken to reduce the individuals exposure.

c. If the safety officer or any supervisor has a question regarding the potential lead hazards and appropriate controls involving an operation which includes or potentially includes lead, the safety officer shall request industrial hygiene officer assistance from a tender, staff or local medical treatment facility or Navy Environmental and Preventive Medicine Unit (NAVENPVNTMEDU).

B1006. CONTROL OF LEAD IN THE WORKPLACE ENVIRONMENT

There are seven basic principles to be used when working with lead or materials that contain lead:

a. **General Workplace Control Practices**

(1) Use non-lead paint.

(2) Keep mechanical grinding and sanding to the absolute minimum with primary reliance on impact tools and authorized chemical strippers for paint removal. Mechanical tools equipped with high efficiency particulate air (HEPA) filtered exhaust for removal and reclamation of lead dust are preferred.

(3) When feasible, minimize the heating of lead and leaded materials by using thermostatically-controlled heating (below 600^{o}F) or removing the lead-containing surface coatings or contaminants prior to heating.

(4) Establish procedures to maintain work surfaces as free of lead dust as is practical. Clean up lead dust with a HEPA filtered vacuum cleaner. Wet sweeping, wet brushing and wiping down with wet rags may be effective in removing lead dust. Rags used for wiping down shall be disposed of as lead waste.

(5) Lead-containing waste, scrap, debris, containers, equipment and clothing consigned for disposal shall be collected, sealed, and labeled in impermeable containers. Transportation shall be conducted in a manner that does not release airborne dust or pollute surrounding waterways. Dispose of lead waste per the procedures of Chapter B3.

(6) To minimize exposure potential, isolate hot work on lead and abrasive lead removal operations from other operations.

b. **Ventilation**

(1) If deemed necessary by the cognizant industrial hygienist, provide fixed local exhaust ventilation connected to high efficiency particulate air filters at the point of particulate generation.

(2) Do not exhaust emissions to another workspace.

c. **Personal Protective Clothing and Related Control Facilities**

(1) Personnel engaged in the handling of lead or in situations where the concentration of airborne particulate lead is likely to exceed the PEL, or where the possibility of skin or eye irritation exists shall remove uniform clothing and wear protective clothing. Consult the command's industrial hygiene officer, industrial hygiene survey, or contact the local BUMED industrial hygienist for specific clothing requirements. Clothing shall be waterproof when wet lead is handled.

(2) Personnel shall remove protective clothing before leaving the work area.

(3) Provide change rooms as close as practical to the lead work area(s) for personnel who work where the airborne lead exposure is above the PEL (without regard to the use of respirators). When possible, locate shower facilities between the "clean" and "dirty" change rooms. Consult the command's industrial hygiene officer, industrial hygiene survey, or contact the local BUMED industrial hygienist for specific decontamination facility requirements.

(4) Launder lead-contaminated clothing to prevent release of lead dust in excess of the AL. Transport lead-contaminated clothing in sealed containers to which are affixed the standard "caution label" (see paragraph B1006e). Notify persons who clean or launder protective clothing or equipment in writing of the potentially harmful effects of exposure to lead and monitor these persons for exposure to lead as required by paragraph B1005.

d. **Respiratory Protection**

(1) Respirators are required where the concentration of airborne, particulate lead is likely to exceed the PEL.

(2) Consult the command's industrial hygiene officer, industrial hygiene survey, or contact the local BUMED industrial hygienist for specific respirator requirements.

e. **Warning Signs and Caution Labels**

(1) **Warning signs** shall be provided and displayed at each location where airborne lead concentrations may exceed the PEL. Signs shall state, as a minimum, the following:

WARNING

LEAD WORK AREA

POISON

NO SMOKING, EATING OR DRINKING

(2) **Caution labels** shall be affixed to containers of lead-contaminated clothing and equipment, raw materials, waste, debris, or other products containing lead. These caution labels shall state:

CAUTION

CLOTHING CONTAMINATED WITH LEAD

DO NOT REMOVE DUST BY BLOWING OR SHAKING

DISPOSE OF LEAD CONTAMINATED WASH WATER ACCORDING TO

APPLICABLE LOCAL, STATE OR FEDERAL REGULATIONS

f. **Housekeeping**

(1) Where lead containing materials are routinely melted, ground or cut, maintain all surfaces as free as practical of lead accumulation. Clean surfaces at least once per shift to prevent accumulation of lead dust.

(2) All cleaning shall use methods such as vacuuming with HEPA filtered vacuum cleaners or washing down where feasible, observing water pollution regulations as they pertain to lead-contaminated wastewater. Only use wet sweeping, shoveling or brushing shall when other methods have been tried and found to be ineffective or infeasible.

(3) Do not use compressed air to clean work surfaces.

(4) When wash down procedures are used to clean surfaces or wetting is used to control dust, treat floor surfaces with a non-skid agent and drain the floor so that excess water is collected in a holding tank for disposal per chapter B3.

g. **Personal Hygiene**

(1) Prohibit eating, drinking, smoking, chewing of tobacco products or gum, the application of makeup, and storage of food and tobacco products in lead work areas.

(2) Personnel working with lead shall wash their hands and faces prior to eating, drinking, smoking or applying cosmetics.

B1007. WASTE DISPOSAL PROCEDURES

a. Lead-containing waste materials are classified as hazardous material and must be handled per Chapter B3. Bag hazardous lead waste in heavy-duty plastic bags or other impermeable containers. Label bags with caution labels described in paragraph B1005e(2).

b. Label containers such as bags and trash cans "**LEAD WASTE ONLY**." Care must be exercised in order to prevent bags and other containers from rupturing when being moved.

B1008. MEDICAL SURVEILLANCE

a. Medical surveillance consists of: preplacement medical evaluation, blood lead monitoring, and follow-up medical evaluation based on the results of blood lead analysis, worker complaint, and physician opinion. Personnel are included in this program when industrial hygiene surveillance indicates that they perform work or are likely to be in the vicinity of an operation which generates airborne lead concentrations at or above the AL more than 30 days per year. Inclusion in this program is based on measured airborne concentrations without regard to respirator use, and therefore does not indicate that an individual is overexposed to lead.

b. Within 5 days of receipt of blood lead monitoring results, the command shall notify affected personnel in writing of his/her blood lead if their blood lead level is at or above 30 ug/100gm. Notification should include the criteria for removal from lead work and, if appropriate, notification that the person is being temporarily removed from lead exposure per reference B10-1. If an individual is pregnant, she should be counseled on the possible adverse affects to the pregnancy or fetus. A decision regarding any action to be taken will be made by the physician on a case-by-case basis.

c. All records of examinations, possible lead-related conditions, related laboratory results and all forms and correspondence related to the person’s medical history shall become a permanent part of the health record and be retained for the period of naval service plus 20 years, or 40 years after the date of the last entry, whichever is longer.

B1009. WRITTEN COMPLIANCE PLAN

The supporting industrial hygiene officer or industrial hygienist should prepare a written compliance plan for processes that produce exposures in excess of the PEL as specified in reference B10-1. The ship only needs a lead compliance plan if lead processes are identified during the baseline industrial hygiene survey. These plans shall include the following items, at a minimum:

a. A description of each operation in which lead is emitted; e.g. machinery used, material processed, controls in place, crew size, employee job responsibilities, operating procedures and maintenance practices

b. A description of the specific means that will be employed to achieve compliance, including engineering plans and studies used to determine methods selected for controlling exposure to lead

c. A report of the technology considered in meeting the permissible exposure limit

d. Air monitoring data that documents the source of lead emission;

e. A detailed schedule for implementation of the program, including documentation such as copies of purchase orders for equipment, construction contracts, etc.

f. A work practice program which includes items required under paragraphs (g), (h) and (i) of reference B10-1

g. An administrative control schedule required by paragraph (e)(6) of reference B10-1, if applicable

h. Other relevant information.

The supporting industrial hygiene officer/industrial hygienist shall review written plans and update as necessary at least every 6 months to reflect the current status.

B1010. TRAINING

a. All personnel who are potentially exposed to lead at or above the AL, and their supervisors shall receive initial training prior to such assignment and at least annually thereafter. This training shall, at a minimum, include the following:

(1) The specific nature of operations during which exposure is possible.

(2) The purpose, proper selection, fit testing, use and limitations of respirators.

(3) The adverse health effects of lead with particular attention to the reproductive effects upon both males and females, including the possible adverse effects on pregnancy and the fetus.

(4) The purpose and description of the medical surveillance program, including the use of chelating agents.

(5) The engineering controls and work practices to be applied and used in the work, including personal protective equipment and personal hygiene measures.

(6) The contents of any compliance plan in effect.

NOTE

The command shall procure sufficient copies of reference B10-1 from the Department of Labor and make them available to personnel required to receive training. They should be provided with Appendix B (Employee Standard Summary) of reference B10-1 and, upon request, any other handout-type materials used in or related to the training.

b. All painted surfaces that cannot be identified as lead-free through laboratory analysis must be handled as containing lead. Division officers shall train personnel assigned to remove paint per the safety precaution for paint removal in chapters C18 and D12.

CHAPTER B10

REFERENCES

B10-1 29 Code of Federal Regulations (CFR) 1910.1025, Lead (As Amended) (NOTAL - This reference should be ordered by commands, as appropriate, to provide to personnel under medical surveillance (see paragraph B1008). Commands with an industrial hygiene officer as safety officer shall have this reference aboard).